



No reply to the Response of July 18, 2002 was received by the undersigned so that on **March 11, 2003**, the undersigned instructed his secretary, Pachack to contact the Group and inquiry as to why a reply was not as yet issued. My secretary, Pachack contacted Mrs. Anita D.

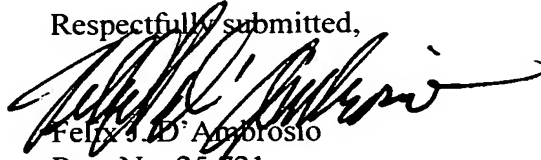
Johnson, and sent her, via facsimile, a copy of the Notification of June 18, 2002 and our Response of July 18, 2002 at Mrs. Johnson's request. A copy of the hand written facsimile transmittal sheet sent by Pachack is enclosed.

No reply was received by the undersigned to this transmission to Mrs. Johnson. Then on *April 29, 2004* a NOTICE OF ABANDONMENT UNDER 37 CFR 1.53(f) or (g) was issued by the IPED and received by the undersigned on *May 2, 2003*. Upon receipt of the Notice, the undersigned telephoned IPED and was advised to contact the PCT Branch as they still had jurisdiction. I telephoned the PCT Legal Branch while at Jones, Tullar & Cooper, P.C. and again after joining my present firm of Bacon & Thomas, PLLC after January 1, 2004 and was advised that they matter should be corrected.

As of today, the undersigned has received nothing from the PCT Office.

It is respectfully requested that this matter be reviewed on an expedited basis and the Notice of Abandonment be withdrawn and this application assigned for examination.

Respectfully submitted,



Felix J. D. Ambrosio  
Reg. No. 25,721

September 23, 2005

**Customer Number \*23364\***  
**BACON & THOMAS, PLLC**  
625 Slaters Lane - 4<sup>th</sup> Floor  
Alexandria, VA 22314  
(703) 683-0500



Commissioner for Patents  
Washington, DC 20231  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/018,967		Werner Sobek	112-041

Felix J. D'Ambrosio  
Jones Tuller & Cooper  
P O Box 2266 Eads Station  
Arlington, VA 22202

CONFIRMATION NO. 6042

**ABANDONMENT/TERMINATION  
LETTER**



\*OC000000009928027\*

MAY - 2 2003

Date Mailed: 04/29/2003

**NOTICE OF ABANDONMENT UNDER 37 CFR 1.53 (f) OR (g)**

The above-identified application is abandoned for failure to timely or properly reply to the Notice to File Missing Parts (Notice) mailed on 03/27/2002.

- No reply was received.

A petition to the Commissioner under 37 CFR 1.137 may be filed requesting that the application be revived.

Under 37 CFR 1.137(a), a petition requesting the application be revived on the grounds of **UNAVOIDABLE DELAY** must be filed promptly after the applicant becomes aware of the abandonment and such petition must be accompanied by: (1) an adequate showing of the cause of unavoidable delay; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(l); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Under 37 CFR 1.137(b), a petition requesting the application be revived on the grounds of **UNINTENTIONAL DELAY** must be filed promptly after applicant becomes aware of the abandonment and such petition must be accompanied by: (1) a statement that the entire delay was unintentional; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(m); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Any questions concerning petitions to revive should be directed to "Office of Petitions" at (703) 305-9282.

*A copy of this notice **MUST** be returned with the reply.*

Customer Service Center  
Initial Patent Examination Division (703) 308-1202  
PART 1 - ATTORNEY/APPLICANT COPY

GEORGE M. COOPER  
DOUGLAS R. HANSCOM  
ERIC S. SPECTOR  
FELIX J. D'AMBROSIO  
WILLIAM A. BLAKE

# JONES, TULLAR & COOPER, P.C.

PATENTS TRADEMARKS AND COPYRIGHTS

SUITE 1002

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ARLINGTON, VIRGINIA 22202

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FACSIMILE 703-415-1508

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COLIN D. BARNITZ

MARYLAND ASSOCIATED OFFICE  
HALL, PRIDDY, MYERS &  
VANDE SANDE  
10220 RIVER ROAD  
POTOMAC, MARYLAND 20854

## FACSIMILE COVER LETTER

### CONFIDENTIAL AND PRIVILEGED

The information contained in this communication is intended for the use of the addressee, and may be confidential, may be attorney-client privileged, and may constitute inside information. Unauthorized use, disclosure, or copying is strictly prohibited, and may be unlawful. If you have received this communication in error, or if you have not received all pages, please telephone the sender immediately at (703) 415-1500 or contact by facsimile at (703) 415-1508.

Date: 3/11/2003

Our Ref: Sober

Your Ref: 10/018,967

To: Anita D. Johnson

From: Pachack

**CONFIRMATION COPY**

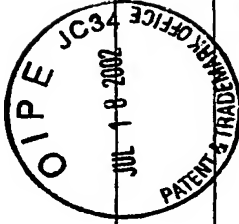
TOTAL NUMBER OF PAGES, INCLUDING COVER PAGE: 5

#### SPECIAL INSTRUCTIONS OR COMMENTS:

Per our telephone conversation of today,  
I'm transmitting herewith a copy of the  
Response to the Notification of Defective Response  
and copy of the Notification dated 6/18/02  
along with a copy of the date-stamped recd.  
card.

W.S. TULLAR & COOPER, P.C.

Case



Inventor

Werner SOBEK

Serial No.

10/018,967

Filing Date

Dec. 26, 2001

Title

LAMINATED GLASS SYSTEM

The stamp of the U.S. Patent Office hereupon may be taken as acknowledging receipt in the above-identified application of the following:

Response and copy of Notification of Defective Response

Application Fee

By

FJD:pp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of )  
Werner Sobek )  
Appln. No. : 10/018,967 )  
Filed : December 26, 2001 )  
For : LAMINATED GLASS SYSTEM )

RESPONSE

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

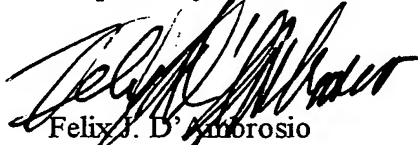
Sir:

Receipt of the NOTIFICATION OF DEFECTIVE RESPONSE, dated June 18, 2002 is gratefully acknowledged.

This NOTIFICATION indicates that "The number of claims in the International Application and the number of claims in the translation are not the same." In fact, the translation includes twenty-two (22) claims and the application as filed (published application WO 00/76763) also includes twenty-two (22) claims.

The reason for the NOTIFICATION is therefore not understood. Clarification is respectfully requested.

Respectfully submitted,

  
Felix J. D'Amorosio  
Reg. No. 25,721

July 18, 2002

JONES, TULLAR & COOPER, P.C.  
P.O. Box 2266 Eads Station  
Arlington, VA 22202  
(703) 415-1500



## UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents, Box PCT  
United States Patent and Trademark Office  
Washington, D.C. 20231  
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.		
10/018,967	Wermer Sobek	112-041		
		INTERNATIONAL APPLICATION NO.		
		PCT/EP00/05270		
		<table border="1"> <tr> <td>IA. FILING DATE</td> <td>PRIORITY DATE</td> </tr> <tr> <td>06/07/2000</td> <td></td> </tr> </table>	IA. FILING DATE	PRIORITY DATE
IA. FILING DATE	PRIORITY DATE			
06/07/2000				

Felix J. D'Ambrosio  
Jones Tuller & Cooper  
P O Box 2266 Eads Station  
Arlington, VA 22202

CONFIRMATION NO. 6042

371 FORMALITIES LETTER



\*OC000000008296800\*

Date Mailed: 06/18/2002

## NOTIFICATION OF DEFECTIVE RESPONSE

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- U.S. Basic National Fee
- Indication of Small Entity Status
- Assignee Statement
- Copy of IPE Report
- Copy of references cited in ISR
- Copy of the International Application
- Copy of the International Search Report
- English Translation of the IA
- Information Disclosure Statements
- Oath or Declaration
- Preliminary Amendments
- Request for Immediate Examination

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Translation of the application into English. The current translation of the application into English is defective as described below.
  - The number of claims in the International Application and the number of claims in the translation are not the same.

Applicant is required to complete the response within a time limit of ONE MONTH from the date of this Notification or within the time remaining in the response set forth in the Notification of Missing Requirements, whichever is the longer. No extension of this time limit may be granted under 37 CFR 1.136, but the period for response set in the Notification of Missing Requirements may be extended under 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

ANITA D JOHNSON

Telephone: (703) 305-3661

PART 1 - ATTORNEY/APPLICANT COPY

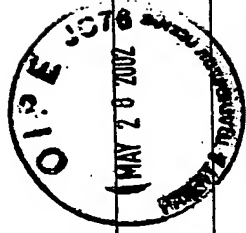
U.S. APPLICATION NUMBER NO.	INTERNATIONAL APPLICATION NO.	ATTY. DOCKET NO.
10/018,967	PCT/EP00/05270	112-041

FORM PCT/DO/EO/916 (371 Formalities Notice)



JONES, TULLAR & COOPER, P.C.

Case



Inventor Werner SOBEK

Serial No. 10/018,967

Filing Date Dec. 26, 2001

Title LAMINATED GLASS SYSTEM

The stamp of the U.S. Patent Office hereupon may be taken as acknowledging receipt in the above-identified application of the following:

two (2) pgs transmittal letter, executed declaration, FORM PTO-1595, executed assignment, notification of missing requirements and English translation of of appln., including: thirteen (13) pgs spec., four (4) pgs claims & six (6) sheets drawings

Application Fee

\$105, Chk #17015

By

FJD:pp

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

10/018,967

INTERNATIONAL APPLICATION NO.  
PCT/EP00/05270INTERNATIONAL FILING DATE  
07 June 2000PRIORITY DATE CLAIMED  
11 June 1999TITLE OF INVENTION  
LAMINATED GLASS SYSTEMAPPLICANT(S) FOR DO/EO/US  
SOBEK, Werner

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☐ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☒ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☐ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Copy of Notification of Missing Requirements

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)  
10/018,967

INTERNATIONAL APPLICATION NO.  
EP00/05270

ATTORNEY'S DOCKET NUMBER

21. ☐ The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$1040.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$740.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☒ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	- 20 =		x \$18.00
Independent claims	- 3 =		x \$84.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00

**TOTAL OF ABOVE CALCULATIONS =**

☒ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above  
are reduced by 1/2. +

**SUBTOTAL =**

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

**TOTAL NATIONAL FEE =**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

**TOTAL FEES ENCLOSED =**

**CALCULATIONS PTO USE ONLY**

\$

\$ 130

\$

\$

\$

\$

\$ 130

\$ 65

\$ 65

\$

\$ 65

\$ 40

\$ 105

Amount to be  
refunded:

\$

charged:

\$

- a. ☒ A check in the amount of \$ 105.00 to cover the above fees is enclosed. (Check No. 17015)
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 10-1213. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card  
information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Felix J. D'Ambrosio  
JONES, TULLAR & COOPER, P.C.  
P.O.Box 2266 Eads Station  
Arlington, VA 22202

SIGNATURE

Felix J. D'Ambrosio  
NAME

25,721

REGISTRATION NUMBER

38584550

**COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

This declaration is of the following type:

- ☐ original
- ☐ design
- ☐ supplemental
- ☒ national stage of PCT
- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part (CIP)

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed for and for which a patent is sought on the invention entitled:

**LAMINATED GLASS SYSTEM**

the specification of which

- ☐ is attached hereto
- ☒ was filed on 26 December 2001, as  
Application No. 10/018,967  
and was amended on \_\_\_\_\_  
(if applicable)
- ☒ was described and claimed in PCT International application  
No. PCT/EP00/05270 filed on 7 June 2000  
and as amended under PCT Article 19 on \_\_\_\_\_  
(if any).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any Amendment referred to above.

I acknowledge duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56.

☐ In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.97.

I hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119, of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent of inventor's certificate having a filing date before that of the application on which priority is claimed:

☐ no such applications have been filed  
☒ such applications have been filed as follows.

Prior Foreign Application(s)

<u>199 26 720.0</u> (Number)	<u>Germany</u> (Country)	<u>11/June/1999</u> (D/M/Y filed )	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<u>100 22 446.6</u> (Number)	<u>Germany</u> (Country)	<u>9/May 2000</u> (D/M/Y filed )	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<u>                    </u> (Number)	<u>                    </u> (Country)	<u>                    </u> (D/M/Y filed )	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code,  
§ 119(e) of any United States provisional application(s) listed below:

<u>                    </u> (Appln. Serial No.)	<u>                    </u> (Filing Date)	<u>                    </u> (patented, pending, abandoned)
--	--	---

I hereby claim the benefit under Title 35, United States Code, Sec. 120 of any United States application(s) listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose all information known to be material to patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

George M. Cooper, Reg. No. 20,201  
Felix J. D'Ambrosio, Reg. No. 25,721  
Eric S. Spector, Reg. No. 22,495

Douglas R. Hanscom, Reg. No. 26,600  
William A. Blake, Reg. No. 30,548

Send correspondence to  
Felix J. D'Ambrosio  
JONES, TULLAR & COOPER, P.C.  
P.O. Box 2266 Eads Station  
Arlington, VA 22202

Direct telephone calls  
TO: Felix J. D'Ambrosio  
(703) 415-1500

I hereby declare all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor Werner SOBEK

Inventor's signature X *Werner Sobek*

Date 23.4.2002

Residence Pfaffenweg 5 A, D-70180 Stuttgart, Germany

Citizenship German

Post Office Address \_\_\_\_\_

## PATENTS ONLY

Tab settings ☐ ☐ ☐ ☐

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

## 1. Name of conveying party(ies):

Werner SOBEK

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

## 3. Nature of conveyance:

☒ Assignment☐ Merger☐ Security Agreement☐ Change of Name☐ Other \_\_\_\_\_Execution Date: April 23, 2002

## 2. Name and address of receiving party(ies)

Name: WERNER SOBEK INGENIEURE GMBH

Internal Address: \_\_\_\_\_

Street Address: Albstrasse 14,D-70597 Stuttgart, Germany

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Additional name(s) & address(es) attached? ☐ Yes ☒ No

## 4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is: \_\_\_\_\_

A. Patent Application No.(s)

10/018,967

B. Patent No.(s)

Additional numbers attached? ☐ Yes ☒ No

## 5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Felix J. D'AmbrosioInternal Address: P.O.Box 2266 Eads Station  
Arlington, VA 22202Street Address: 2001 Jefferson Davis Hwy.  
Suite 1002City: Arlington State: VA ZIP: 222026. Total number of applications and patents involved: 17. Total fee (37 CFR 3.41).....\$ 40.00☒ Enclosed☐ Authorized to be charged to deposit account

## 8. Deposit account number: \_\_\_\_\_

(Attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

## 9. Statement and signature.

*To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.*Felix J. D'Ambrosio

Name of Person Signing

Signature

May 28, 2002

Date

2

Total number of pages including cover sheet, attachments, and document:

Mail documents to be recorded with required cover sheet information to:  
Commissioner of Patents & Trademarks, Box Assignments

ASSIGNMENT

In consideration of One Dollar (\$1.00), and other good and valuable consideration, the receipt of which is hereby acknowledged, I, the undersigned,


**Werner SOBEK**

Hereby sell, assign and transfer to **WERNER SOBEK INGENIEURE GMBH**, a corporation of Germany, having a place of business at Albstrasse 14, D-70597 Stuttgart, Germany, its successors, assigns and legal representatives, the entire right, title and interest for the United States and all foreign countries, in and to any and all improvements which are disclosed in the application for United States Letters Patent, Appln. No. 10/018,967, filed on December 26, 2001 and is entitled: **LAMINATED GLASS SYSTEM**, and in and to said application and all divisional, continuing, substitute, renewal, reissue, and all other applications for Letters Patent which have been or shall be filed in the United States and all foreign countries on any of said improvements; and in and to all original and reissued patents which have been or shall be issued in the United States and all foreign countries on said improvements;

Agree that said Assignee may apply for and receive Letters Patent for said improvements in its own name; and that, when requested, without charge to but at the expense of said Assignee, its successors, assigns and legal representatives, to carry out in good faith the intent and purpose of this assignment, the undersigned will execute all divisional, continuing, substitute, renewal, reissue, and all other patent applications on any and all said improvements; execute all rightful oaths, assignments, powers of attorney and other papers; communicate to said Assignee, its successors, assigns, and representatives, all facts known to the undersigned relating to said improvements and the history thereof; and generally do everything possible which said Assignee, its successors, assigns or representatives shall consider desirable for aiding in securing and maintaining proper patent protection for said improvements and for vesting title to said improvements and all applications for patents and all patents on said improvements, in said Assignee, its successors, assigns and legal representatives; and

Covenant with said Assignee, its successors, assigns and legal representatives that no assignment, grant, mortgage, license or other agreement undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

Date 23 APRIL 2002

By X  (L.S.)  
(Werner SOBEK)



## COMPOSITE PANEL SYSTEM

### Description

The present invention relates to a composite panel system as generically defined by the preamble to claim 1.

5           In such composite panel systems, such as composite safety glass, once the panel has begun to break there is a so-called "residual load-bearing capacity", which is absolutely necessary for the use of such panels, such as in  
10           glazings in the overhead region or in glazings that can be walked on and that secure against collapse. The magnitude of the residual load-bearing capacity can be changed by numerous factors and is thus difficult to estimate. These factors include the type of panel materials used, in the case of  
15           composite panel systems the geometry of the layer structure, the type of intermediate layer, and so forth, as well as the manner of load introduction, the ambient temperature, and the breakage pattern of the damage. In the event of an unfavorable choice of these factors, there is often the risk that the residual load-bearing capacity of the composite  
20           panel system will be inadequate or no longer adequate.

          In the current state of the art, for overhead glazings and glass panel systems that can be walked on and that secure against collapse, not only the load-bearing capacity but the residual load-bearing capacity must be proven, which must  
25           always be adapted to the particular component and the safety requirements for it. Proving the residual load-bearing capacity can be done at present only experimentally, however, that is, in tests of original components by order of the building inspectors; in general, one or more panels of the  
30           structure to be tested are destroyed in the process, and the

time until complete failure of the panel has to be measured. Complete failure also means that the panel comes entirely or partly loose from its support structure and falls off.

5 In composite panel systems, it is known to achieve the residual load-bearing capacity solely by means of a homogeneous intermediate layer, for instance of polyvinyl butyral (PVB); depending on the breakage pattern and the strength of the intermediate layer, this residual load-bearing capacity is correspondingly low. The PVB layers used  
10 until now do not assure adequate residual load-bearing capacity in certain composite panel systems, since PVB is a thermoplastic that is extremely capable of creepage and thus its material properties are highly temperature-dependent. PVB at room temperature is accordingly relatively readily  
15 expandable and is therefore resistant to absorbing tensile forces. Cast resin composites, which from the standpoint of noise abatement are more favorable than PVB, are also known but have practically no or hardly any residual load-bearing capacity, so that composite panel systems of that type offer  
20 no safety or security.

The component tests that are often required when permits for construction of a composite panel system are granted by building inspectors are an insupportable financial burden on the building sponsor.

25 From German Utility Model DE 298 09 607 U1, a composite panel system has also been disclosed in which so-called foreign materials are embedded in the synthetic resin intermediate layer. This design of the composite panel system is intended solely for decorative purposes, for

increasing the decorative design options of such composite panel systems.

From German Patent Disclosure DE 195 39 214 A1, a composite panel system of the type defined at the outset has also been disclosed, in which embedding plastic threads in the plastic intermediate layer is meant to achieve greater fire safety.

The object of the present invention is therefore, even under unfavorable conditions, to assure in advance an increased residual load-bearing capacity in composite panel systems of the types defined at the outset and to prevent the complete breakage and thus separation from the support structure, so that new uses can be opened up to such composite panel systems.

For attaining this object, in a composite panel system of the types defined at the outset, the characteristics recited in claim 1 are provided.

By the provisions according to the invention, the residual load-bearing capacity is increased multiple times over the former values. The residual load-bearing capacity can now be detected computationally, so that expensive component tests are virtually no longer necessary. Mechanically fastening the composite panel system in the support structure and/or mechanically coupling the reinforcing element to the support structure prevents the panel from separating completely from the support structure and causing consequent damage. Further areas of use for such panels are thus possible, such as for the overhead region,

for glass that can be walked on, or as a glazing that secures against collapse, as well as uses as primary load-bearing components. As materials that can be considered, glass is especially important, but other minerally bound materials can also be considered, such as natural stone, ceramic, porcelain, and the like, either alone or in combination.

Advantageous features of the mechanical fastening of the composite panel system in a support structure are obtained by characteristics of one or more of claims 2 through 4. The size of the fastened portion relative to the length of the composite panel system is essential and is also intended to assure anchoring of the composite panel system in the support structure on the applicable edge even if the composite panel sags as a result of breakage, thus reducing the size of the fastened portion. The fastening can be provided continuously over the entire width, or intermittently, transversely to the length of the composite panel. A sufficiently high transverse pressure of the clamping construction exists if the fastening of the composite panel is assured even after the composite panel breaks.

The mechanical coupling of the reinforcing element to the support structure can be provided inside the panel, in accordance with the characteristics of claim 5, or peripherally outside the panel, in accordance with the characteristics of claim 6. Which of these two types will advantageously be used depends in particular on the type of support structure, that is, whether it involves individual bolts or a framelike support structure.

With the characteristics of claim 7, a more-uniform load-bearing capacity is obtained over the entire panel surface, regardless of its installed and braced position.

5 For the reinforcing element, various materials in different forms can be used, as disclosed by the characteristics of one or more of claims 8 or 9 and 10 through 16. Depending on the type and design of the reinforcing element, various possibilities of mechanical coupling to the support structure are obtained. For  
10 instance, looplike connections as well as soldered connections and the like to the support structure are possible. Depending on the type of material and the form of inlay, additional advantages are obtained, such as a reduction in light transmission for the sake of also  
15 attaining protection against sunlight in the case of various glasses. Also in glasses, the reinforcing element can serve the purpose of vision protection, on the order of a curtain. It is also possible now for the noise abatement properties known from cast resin composites to be exploited for the  
20 safety field as well.

Advantageous provisions in the construction of such composite panel systems will become apparent from the characteristics of claims 17 and 18.

25 Especially advantageous applications will become apparent from the characteristics of claims 19 and/or 20.

Further details of the invention can be learned from the ensuing description, in which the invention is described and explained in further detail in terms of exemplary

embodiments shown in the drawing. Shown are:

Fig. 1, in a schematic, perspective and partly cutaway view, the structure of a composite panel in a first exemplary embodiment of the present invention;

5 Figs. 2A and 2B, views corresponding to Fig. 1, but for a second and third exemplary embodiment, respectively, of the present invention;

Fig. 3, a view corresponding to Fig. 1, but for a fourth exemplary embodiment of the present invention;

10 Fig. 4, in a schematic, perspective, exploded view, the structure of a composite panel in a fifth exemplary embodiment of the present invention; and

Figs. 5A and 5B, exemplary embodiments for joining the composite panel or its reinforcing elements to a support structure.

15

The composite panel system 10, 110, 210, 310 and 410 shown in several exemplary embodiments in the drawing, which because of its increased residual load-bearing capacity is used as a safety-type composite panel system and can be employed in the overhead region and/or as a system that can be walked on or secures against collapse (both vertically and horizontally), has a two-panel structure of practically arbitrary surface area in the exemplary embodiments shown. Although below, in terms of the exemplary embodiment shown, glass panels are discussed, it is understood that the panels used can also comprise some other brittle material, such as

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natural stone, ceramic, porcelain and the like. Such a composite panel system can also be constructed with panel elements of the same material or different materials. Furthermore, composite panel systems with more than two panel elements are possible.

In accordance with the drawing an upper glass panel 11 and a lower glass panel 12 of a desired surface area, each with a desired thickness, are provided. The glass panels 11, 12 can be made from float glass, tempered safety glass, TVG glass or other improved glasses. Between the two glass panels 11 and 12, an adhesive intermediate layer 14 is provided, which is made for instance from a polyvinyl butyral (PVB) layer.

In the exemplary embodiments of Figs. 1, 2A, 2B and 3, the intermediate layer 14 is a uniform layer in which a reinforcement 15, 115, 215 and 315, respectively, is placed. In the exemplary embodiment of Fig. 4, the intermediate layer 14 is assembled from one layer element 14' adjacent to the upper glass panel 11 and one layer element 14'' adjacent to the lower glass panel 12. A reinforcement 415 is placed between the two layer elements 14' and 14'' of the intermediate layer 14.

The reinforcement serves to enhance or increase the load-bearing safety of the composite panel system 10, 110, 210, 310 and 410, and in the finished state of the composite panel system shown in Figs. 1, 2A, 2B and 3 it is embedded in the adhesive intermediate layer 14. Glass fibers, carbon fibers and metals can be considered as materials for the reinforcement 15, 115, 215, 315 and 415. The form of inlay

of the reinforcement 15, 115, 215, 315 and 415 varies in the various exemplary embodiments shown. In Fig. 4, for instance, the reinforcement 415 is a grid of one of the aforementioned materials, and the grid can be coated in some  
5 suitable way. It is understood that as a form of inlay, woven fabric, ribbons, rovings, yarns, cords, twisted yarns, threads, metal profiles, or prestamped thin metal sheets, such as perforated metal sheets, are also suitable.

10 In the exemplary embodiment of Fig. 1, the reinforcement 15 is formed by cords, which extend in a meander pattern in one direction of the composite panel system 10, while the loops 21 created by the meander 18 extend out past the two opposed edges 22 of the panel 10.

15 In the exemplary embodiment of Fig. 2A, the reinforcement 115 is formed by two meanders 18 and 19 disposed perpendicular to one another, whose loops 21 and 23 created by the respective meander pattern extend out past the applicable edges 22 and 24 of the composite panel 110.

20 It is understood that in both of these exemplary embodiments, the reinforcing cords 15, 115 for forming the loops 21, 23 can also each be inlaid in the form of a single elongated oval.

25 The outward-extending loops 21, and 21 and 23, respectively, of the reinforcements 15 and 115 are coupled mechanically or joined in a manner not shown to a support structure, also not shown here, of the composite panel 10 and 110, respectively. For instance, if the support structure secured to the building is formed by parallel rails or by a



frame, then the respective loops 21, and 21 and 23, that extend outside can be clamped, soldered together, or similarly fixed between the rails or the frame. For instance, if the support structure is formed by individual bolts, then the loops 21, 23 can be suspended from the supporting bolts and fixed in some way suitable for the material involved.

In the exemplary embodiment of Fig. 2B, the reinforcement 215 is formed by a grid of elongated ribbons, fibers, braided cables, wires or the like extending parallel and perpendicular to one another, whose free ends 221, 223 are extended out of the applicable edges 222 and 224 of the composite panel 210. In the exemplary embodiment shown, these elongated reinforcing elements are shown in the form of braided cables or the like, whose ends 221 and 223 extended out of the composite panel 210 are twisted open. Also in Fig. 2B, a support structure in the form of a frame 31, shown only in part, can be seen onto which the twisted-open ends 221, 223 are for instance firmly soldered.

In the exemplary embodiment shown in Fig. 3, the reinforcement 315 is likewise formed for example of wires, braided cables, cords, ribbons or the like, which extend in one direction or, as shown here, crosswise and parallel to one another at a certain spacing. In certain regions, such as regions of the composite panel 310 near the corners, two parallel-extending strands 27 each of the cords are interrupted in their parallelism via helical windings 28 resting on one another and are then extended onward. These helical windings 28 surround a bore 29 that penetrates the composite panel 310. In a manner not shown, the bores 29

serve to receive a support structure, also not shown, that for instance protrudes from a building wall; the helical windings 28 of the strands 27 of the cords of the reinforcement 315 are joined to the applicable support structure, such as stay bolts. It is understood that these mechanical coupling regions 28, 29, which in this exemplary embodiment are within the outline of the composite panel 310, can be provided at arbitrarily selected regions of the composite panel 310. The other strands 27' of the cords of the reinforcement 315 are cut off at their ends peripherally of the composite panel 310.

The mechanical coupling of the reinforcement 15, 115, 215 and 315 to the support structure or substructure (for instance 31), shown only in part, of the composite panel 10, 110, 210 and 310 prevents the panel, in the event of breakage, from separating from its support structure and causing consequent damage.

It is understood that, although not shown, a corresponding mechanical coupling of the reinforcement 415 is provided for the composite panel 410 of Fig. 4 as well.

It is understood that the mechanical coupling of the reinforcement and the support structure of the panel will vary depending on the type of reinforcement; for instance, a wraparound tie, clamping connection, soldered connection or the like can be provided. Depending on the type of support structure, mechanical coupling will be done either inside or outside the panel.

Figs. 5A and 5B show exemplary embodiments for

connecting a composite panel system 10, 110, 210, 310, 410 to a support structure 131 and 231, respectively, shown here as an example.

Fig. 5A shows a support structure 131 in the form of two parallel, rigid plates 32 and 33, which are provided for instance continuously over the length of one edge of a composite panel system 410. The applicable edge 422 of the composite panel system, at which the reinforcing elements 415 are not extended outward, is thrust between the plates 32 and 33 by a certain amount of the length of the composite panel 410, and the plates have a clamping construction 34, so that a relatively high transverse pressure for clamping purposes can be brought to bear on the inserted composite panel or its peripheral region. To that end, the plates 32 and 33 oriented toward the composite panel are provided with clamping jaws 35, while on the side remote from them of the clamping screw unit 34 they are provided with a spacer 36. Thus the composite panel system 410 is fastened on one side in the carrier 33 of the support structure 131. The size of the fastening zone between the plates 32 and 33 is such that in the event of breakage of the composite panel system 410, adequate clamping is still assured.

Fig. 5B shows a support structure 231 in which two adjacent composite panel systems 110 and 110' are fastened in place and held together; in addition to the clamping of the edges of the composite panels, a mechanical coupling of the reinforcing elements to the support structure 231 is simultaneously achieved.

In the exemplary embodiment shown, the support

structure 231 has a bridgelike carrier 37 and a spaced-apart flat carrier 39, which can be moved toward one another by means of a screw connection 38. Between the two carriers 36 and 37, the applicable edges of adjacent composite panels 110, 110' can be fastened or clamped in place. The carriers 37 and 39 have toothlike clamping jaws 41, with which a suitably strong clamping force can be exerted by tightening the screw connection 38. The bolt 42 of the screw connection 38 simultaneously acts as a coupling element for mechanically coupling the loops 121, 121' of the reinforcing element 115 that are extended out of the edges of the composite panel systems 110, 110'. The loops 121, 121' are retained for instance between clamping disks or jaws 43, 44 that are connected with the screw connection 38.

It is understood that the connection shown in Fig. 5B for the composite panel system 110 with a support structure 231 can also be combined with a support structure 131 of Fig. 5A on the opposite side. In this kind of two-sided fastening of the composite panel system, it is achieved that even if the composite panel breaks and consequently sags, the clamping on both sides together with the mechanical coupling of the reinforcing elements to the one support structure assures a hold of the composite panel system.

In Fig. 4, the composite panel system 410 is produced in such a way that after the parts 11, 12 and 14', 15'', 14'' are placed on one another, the reinforcement 415 is embodied in the intermediate layer 14 by the application of heat and pressure, and the adhesive bonding of the two glass panels 11 and 12 is effected via the intermediate layer 14.

5 In an exemplary embodiment not shown, the reinforcement 15 is put between the upper glass panel 11 and the lower glass panel 12, and the two panel elements are kept spaced apart and are sealed at the edges. Through an opening, the interior defined by the two panel elements 11 and 12 is potted with a casting resin, a suitable plastic, or the like, and the reinforcement is embedded in the casting resin or plastic potted composition.

10 As noted, a composite panel system comprising other materials than glass, with otherwise the same or different material, can be produced in a corresponding way. It is also possible in a corresponding way to produce a composite panel system made of more than two panels.

15 The adhesive intermediate layer 14 is embodied or selected to suit the type of material comprising the panel. If glass panels are selected as the panels, it is expedient for the intermediate layer to be embodied as transparent. The same is true for the materials used for the reinforcement, which when glass panels are used in the  
20 composite panel system simultaneously has the capability of lessening the light transmission, providing a vision protection function, or even certain design functions. If casting resin is used as the intermediate layer, a previously unattained combination of noise abatement and adequate  
25 residual load-bearing capacity is achieved.

3838 016 Fuh/lbe  
September 3, 2001

### Claims

1. A composite panel system (10, 110, 210, 310, 410) comprising at least two panel elements (11, 12) of the same or different brittle materials, in particular glass, wherein the panel elements (11, 12) are joined superficially to one another by an intermediate layer (14) of an adhesive plastic, in which intermediate layer a reinforcing element (15, 115, 215, 315, 415) is embedded, characterized in that the composite panel system (10, 110, 210, 310, 410) provided with the reinforcing element can be mechanically fastened to a support structure (31, 131, 231).

2. The composite panel system of claim 1, characterized in that the reinforcing element (15, 115, 215, 315, 415) is also held mechanically coupleably on the support structure (31, 131, 231).

3. The composite panel system of claim 1 or 2, characterized in that a rigid fastening device (33) is provided, whose fastening zone embracing the composite panel system has a size which even if the composite panel system breaks assures reinforcing anchoring.

4. The composite panel system of at least one of claims 1-3, characterized in that the fastening device is provided either continuously or intermittently along one edge of the composite panel system.

5. The composite panel system of at least one of claims 1-4, characterized in that the fastening device is provided in the form of a clamping construction with high transverse pressure.

6. A composite panel system (10, 110, 210, 310, 410) comprising at least two panel elements (11, 12) of the same or different brittle materials, in particular glass, wherein the panel elements (11, 12) are joined superficially to one another by an intermediate layer (14) of an adhesive plastic, in which intermediate layer a reinforcing element (15, 115, 215, 315, 415) is embedded, characterized in that the reinforcing element (15, 115, 215, 315, 415) is provided over the entire surface over the panel elements (11, 12) and is retained mechanically coupleably on a support structure (31, 131, 231).

7. The composite panel system of at least one of claims 1-6, characterized in that the reinforcing element (15) is connectable inside the panel (10) to the support structure.

8. The composite panel system of at least one of claims 1-6, characterized in that the reinforcing element (15) on at least one edge of the panel extends out of the panel (10) and is connectable on its outer periphery to the support structure.

9. The composite panel system of at least one of claims 1-5, 7 and 8, characterized in that the reinforcing element (15) is provided over the entire surface of the panel (11, 12).

10. The composite panel system of at least one of

claims 1-9, characterized in that the reinforcing element (15) is of glass fibers or carbon fibers.

11. The composite panel system of at least one of claims 1-9, characterized in that the reinforcing element (15) is of metal.

12. The composite panel system of at least one of claims 1-11, characterized in that the reinforcing element (15) is formed by a woven fabric.

13. The composite panel system of at least one of claims 1-11, characterized in that the reinforcing element (15) is a grid.

14. The composite panel system of at least one of claims 1-9, characterized in that the reinforcing element (15) is formed by ribbons, rovings, yarns, cords, twisted yarns, threads, or the like.

15. The composite panel system of claim 14, characterized in that the ribbons, rovings, yarns, cords, twisted yarns, or threads are extended out of the panel (11, 12) in one direction or in directions perpendicular to one another in a meander pattern.

5

16. The composite panel system of at least one of claims 1-11, characterized in that the reinforcing element (15) is formed by a thin metal sheet.

17. The composite panel system of claim 16, characterized in that the thin metal sheet is provided with perforations or similar stamped features, by which the support structure is guided.

AMENDED SHEET



18. The composite panel system of at least one of claims 1-11, characterized in that the reinforcing element (15) is profiled.

19. The composite panel system of at least one of claims 1-17, characterized in that the intermediate layer (14) comprises two partial layers (14', 14''), and that the reinforcing element (15) is placed between the two partial layers (14', 14'').

20. The composite panel system of at least one of claims 1-17, characterized in that the reinforcing element (15) is placed between two panel elements (11, 12) that are kept spaced apart and is potted, forming the intermediate layer (14).

21. The composite panel system of at least one of claims 1-20, characterized in that it is embodied as an overhead glazing.

22. The composite panel system of at least one of claims 1-20, characterized in that it is embodied as a glazing that can be walked on or that secures against collapse.

FJD



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CONFIRMATION NO. 6042

371 FORMALITIES LETTER



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### NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- U.S. Basic National Fees
- Indication of Small Entity Status
- Copy of IPE Report
- Copy of references cited in ISR
- Copy of the International Application
- Copy of the International Search Report
- Preliminary Amendments
- Request for Immediate Examination

APR 1 2002

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Translation of the application into English.
- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- \$65 Surcharge for providing the oath or declaration later than the appropriate 30 months months from the priority date (37 CFR 1.492(e)) is required.

**ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTH FROM THE DATE OF THIS NOTICE OR BY 22 or 32 MONTHS (where 37 CFR 1.495 applies) FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.**

The time period set above may be extended by filing a petition and fee for extension of time under the provisions

of 37 CFR 1.136(a).

**SUMMARY OF FEES DUE:**

Total additional fees required for this application is **\$65** for a Small Entity:

- **\$65** Late oath or declaration Surcharge.

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

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**PART 1 - ATTORNEY/APPLICANT COPY**

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10/018,967	PCT/EP00/05270	112-041